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# Relationships among freshman background characteristic variables, misconceptions about major and satisfaction with major area of study

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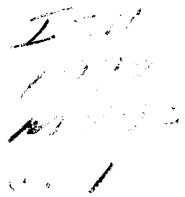

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# DEDICATION

This thesis is dedicated to my late beloved Mother, Fleciah Wambui, and to my Father, Teman Gitau, for their love and prayers.

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# CHAPTER I.

## INTRODUCTION

For the majority of college students, selecting a major area of study is often a difficult process. It is also one of the most important decisions in their lives. Many factors influence a student's choice of a major. Kirk (1990) postulates that preference for a particular area of study is influenced by opportunities for employment, advancement, and financial rewards. Hafer and Schank (1982) indicate that interest in the subject matter, prestige, and job security greatly influence the academic fields students enter. Having friends, relatives, previous courses or work experience in a field increases the likelihood that a student will select the same or a related field (Hafer & Schank, 1982; Szafran, 1982).

Polacheck (1978) notes that students who emphasize monetary rewards in their selection of a college major are likely to be in business or engineering fields. Those who are less concerned with financial returns tend to major in social sciences or humanities. In a study on academic choices among graduate students, Malaney (1987) found that the most frequently cited reasons for attending graduate school were desire to learn and personal satisfaction. Part-time students were more likely to pursue a college degree for satisfaction while full-time students pursued college degrees to prepare themselves for future careers.

Gender differences have been noted too; a higher percentage of men choose majors such as engineering and business, whereas a majority of women tend to choose majors like home economics, education, and nursing (Linhart & Yeager, 1979; Whigham, 1985).

Powers and Lehman (1983) have even gone further as to suggest ethnic patterns in the choice of college majors. A significantly larger proportion of black students was found in the social sciences, whereas a significantly greater percentage of white students was found in the biological and physical sciences (Powers & Lehman, 1983).

Other factors that influence the selection of a college major may be unique to the individual. For example, intellectual capability, exposure and mastery of fundamental skills at high school, and academic choices early in their academic careers may lead some students to certain areas of study but eliminate the choice of certain majors for other students.

Regardless of the reason for choosing a major area of study, students' satisfaction with their chosen majors should be important in determining their academic success. Hence, understanding the motivation behind students' choice of and satisfaction with the major area of study should provide some insights into the complex problem of student attrition especially in the face of declining college enrollments (Jones, 1986; Siedman, 1991; Tinto, 1987). According to Tinto (1987), the attrition rate in public two-year institutions is projected at 54 percent and 34 percent of those who enroll in four-year institutions will leave the institutions without graduating. Similarly, the Carnegie Council (1980) projected a reduction of approximately 29 percent in college enrollment from 1980 to the late 1990.

Spady (1970) was perhaps the first person to suggest a theoretical model which could be used in analyzing the dropout process. Spady (1970) based his model on Durkheim's theory of suicide and suggested that the decision to leave college is influenced by family and previous educational background, academic potential, attitudes, interests and dispositions that are compatible with the attributes and influences of the environment, friendship support, intellectual development, grade performance, social integration, satisfaction, and institution commitment. Spady (1970) argued that the inclusion of satisfaction as an intervening variable in the causal model was based on the assumption that one's satisfaction with the college experience depended on the available social as well as academic rewards. Students who are satisfied with their majors are more likely to reap the greatest academic rewards.

## The Study Setting

This study was carried out in the College of Architecture and Engineering at the University of Nairobi, Kenya. Kenya is on the eastern coast of Africa along the Equator and covers 564,000 square kilometers. Nairobi is the capitol city. Kenya's population is currently estimated at 26 million with a natural rate of growth of 3.6 percent per year. Overall, the age group 0-18 years forms 60 percent of the population (The Population Council, 1992).

Formal education was introduced in Kenya by the British at the turn of the century (Bogonko, 1992). The establishment of higher education in Kenya began with the opening of the Royal Technical College in Nairobi in 1956; which generally offered post-secondary technical training. In 1963 the institution became a college of the University of East Africa, an inter-territorial university that served the three East African countries of Kenya, Uganda, and Tanzania. The University of East Africa was dissolved in 1970 and the three East African countries set up their own national universities. This saw the creation of the University of Nairobi as the first public university in Kenya (Gogo & Kirimania, 1990). Three other public universities have since been established.

The University of Nairobi is comprised of six colleges. These are: College of Architecture and Engineering, College of Biological and Physical Sciences, College Agriculture and Veterinary Sciences, College of Health Sciences, College of Education and External Studies, and the College of Humanities and Social Sciences. The undergraduate population at the University of Nairobi has grown from 2,584 in 1970 to 13,762 in 1991 (Gogo & Kirimania, 1990).

There are eight departments offering undergraduate programs in the College of Architecture and Engineering. These are: Architecture, Building Economics, Land Economics, Design, Civil Engineering, Mechanical Engineering, Electrical Engineering, and Surveying and Photogrammetry. Except for the departments of Design and Surveying and

Photogrammetry, all the departments embrace a diversity of courses with the common theme being the physical environment and the exercise of human control over it. For the purposes of this study, these two departments have been left out.

The demand for the undergraduate programs offered at the College of Architecture and Engineering has risen substantially over the years. The main reasons for this increased demand have been a lack of similar programs in the other public universities and the rapidly rising student population at the high school level. As a result, architecture and engineering programs have become what may be labeled as "high profile degree programs". Nevertheless, there exists a notion among many educators that many students may be selecting these programs with little consideration of what each program entails. This notion is perhaps based on the numerous cases of students in the whole university wanting to change their majors at the beginning of every academic year. The problem has grown to such proportions that the vice-chancellor of the University of Nairobi recently observed that "we have had students going to the extent of attempting suicide because they feel that they are pursuing wrong programs" (Omari, 1992, p.10).

Freshmen at the University of Nairobi select their majors during their final year in high school. Admission to any degree program is based on the average score in the national examination, the Kenya Certificate of Education. This is a mandatory examination taken at the end of the final year in high school. Students applying for admission in the College of Architecture and Engineering are expected to obtain a score of B or better in science courses such as physics, chemistry, and mathematics.

After being admitted to a degree program, students are not encouraged to change majors. Transfers among departments are therefore few and only involve the very needy cases. These transfers are usually effected within the first two weeks of the academic year. Beyond that, changing one's major is virtually impossible. The structured nature of the

university educational system is largely responsible for this. First, the curriculum for each major in each year of study is set. Electives do not exist. Secondly, freshmen are admitted once a year and therefore courses are offered only once during the academic year. A student wishing to transfer to another department later in the first semester would have to wait almost a whole year. Thus, if such students do succeed in transferring to other programs, they would end up spending an extra year in college. Making the right choice the first time should therefore be a goal, if not a must, for all students.

Like any university, the University of Nairobi runs an orientation program for all freshmen during the first week of the academic year. Individual departments organize sessions during the orientation week in which they provide students with information on the degree programs. Since the freshmen have already chosen their majors at this point, it is reasonable to assume that the information provided by the departments strengthen their beliefs and attitudes towards their majors. It is therefore justified to also assume that freshmen have formed some opinion about their majors during the first semester of their college career.

## Need for the Study

Little empirical research has been done in Kenya to determine the quantity and quality of information college bound students have regarding university programs. Equally disturbing is the lack of any studies to determine the relationships among students' characteristics, satisfaction with college majors, and misconceptions about majors. In the absence of such studies, it has become difficult to establish the type of information on university programs students need at the high school level. It has also been difficult to establish the quality of pre-college counseling and the areas that may need improvements.

At a more general level, university education planners have little to go by regarding the true demand patterns for college majors in Kenya. It is likely that emphasis has been put on

degree programs which are not necessarily popular but which students nevertheless select because of a lack of better alternatives.

Given the rising demand for high profile degree programs at the University of Nairobi, the rising cost of university education in Kenya, and the structured nature of university education in Kenya, it is imperative that students make the right choices when selecting their college majors. There is therefore a need to investigate not only the factors that influence students' satisfaction with their majors, but also any misconceptions they may have about those majors early in their college career. This would hopefully reduce the number of students who either request for transfer to different degree programs or drop out of college. This research should serve as a pioneering study of the factors that influence students' satisfaction with their college majors.

## Purpose of the Study

This study was prompted by the numerous requests for student transfers in the College of Architecture and Engineering at the University of Nairobi. The primary purpose of this study is to examine the relationships between freshman background characteristic variables and satisfaction with major area of study in the College of Architecture and Engineering, University of Nairobi. It was perceived that increased information about the relationships between students' background and their satisfaction with major would lead to a greater understanding of their needs. This would be helpful in the development of academic counseling and orientation programs which are responsive to those needs. This is likely to reduce the number of students requesting for transfers to different departments or dropping out of college all together.

A second purpose of this study was to investigate the frequency of some commonly held misconceptions about majors in the College of Architecture and Engineering and the

relationship among number of misconceptions, students' background characteristics and satisfaction with major. It was perceived that misconceptions would be related to students' beliefs and attitudes towards their majors.

A third purpose of this study was to investigate students' perception of the completeness of information on majors provided by the departments during orientation. It was perceived that provision of complete information about majors would not only remove any misconceptions held by the students but would also solidify any positive beliefs and attitudes which students may have toward their majors.

## Dependent and Independent Variables

The main dependent variable in this study is satisfaction with college major. The areas of interest regarding satisfaction with college major are: employment opportunities after graduation, length of the degree program, opportunities for further studies within the major, availability of learning facilities within the department, career preparation, prestige and relevance of subject matter. Job opportunities, subject matter, prestige, and career preparation and advancement have previously been found to influence the choice of college majors (Hafer & Schank, 1982; Malaney, 1987; Szafran, 1982).

Number of misconceptions about majors is the other dependent variable. The areas of interest are: students' attitude towards mathematics, students' perception of the level of difficulty of degree programs in architecture and engineering, students' perception of the failure rate among architecture and engineering majors, employment opportunities and salary scales for architecture and engineering majors after graduation.

The independent variables in this study are: gender, college major, prior attendance at talks on university programs, prior reference to university catalog, prior visits to departments for information on majors, main source of influence in selecting the major, presence of a

relative or friend with a degree in architecture or engineering, average score in the national examination, and student's perception of the completeness of information about major provided by the department during orientation.

## Research Hypotheses

The primary research hypotheses of this study are:

1. There is a significant negative relationship between satisfaction with college major and number of misconceptions about majors.

2. There is a significant positive relationship between satisfaction with major and perception of completeness of information on major.

3. There is a significant positive relationship between satisfaction with major and average score in the national examination.

4. Male students are significantly more satisfied with their majors than female students. Because engineering majors have traditionally been male dominated programs, female students entering such areas may feel intimidated and therefore become dissatisfied.

5. Satisfaction with major differs significantly by department. The proposition here is that students in departments which provide more information during orientation are likely to be more satisfied with their majors than students in departments which provide less information during orientation.

6. Satisfaction with major differs significantly by main source of influence in selecting the major. The rationale here is that students who are self-influenced will be motivated to find out more about the program prior to selecting the major and are therefore likely to be more satisfied than students who are influenced by others.

7. Students who had heard talks on university programs are significantly more satisfied with their major than students who had heard no talks on university programs.

8. Students who previously sought information from the departments are significantly more satisfied with their majors than students who did not seek information from the departments.

9. Students who had previously read the university catalog are significantly more satisfied than students who had not read the university catalog.

10. Students with a relative or family member who has a degree in architecture or engineering fields are more satisfied than students who do not have a friend or relative with a degree in architecture or engineering.

11. There is a significant negative relationship between number of misconceptions on majors and perception of the completeness of information about major provided by the department during orientation.

12. Female students have significantly more misconceptions about majors than male students. This hypothesis is based on the proposition that entering female students will be influenced by the traditional belief that engineering is a difficult field that should be left to males.

13. Students who had heard talks on university programs have significantly fewer misconceptions about majors than students who had heard no talks on university programs.

14. Students who previously sought information from the departments have significantly fewer misconceptions about majors than students who did not seek information from the departments.

15. Students who previously read the university catalog have significantly fewer misconceptions about majors than students who had not read the university catalog.

16. Students with a relative or a family member who has a degree in architecture or engineering have significantly fewer misconceptions about majors than students who have no relative or family member with a degree in architecture or engineering.

17. Perception of the completeness of information on major provided by departments differs significantly by department. This hypothesis is based on the rationale that some

departments will provide students with more information during orientation than others. Students from such departments are likely to be more satisfied with their majors.

## Assumptions of the Study

The instrument developed for this study was administered to freshmen in the College of Architecture and Engineering during their first semester in college. It is assumed that students had already formed an opinion about their majors by then and that the instrument is an appropriate and reliable tool in measuring the variables of interest. It is further assumed that students' responses are honest and accurate.

## Limitations of the Study

The analysis is limited to freshmen in the College of Architecture and engineering at the University of Nairobi in Kenya. The study was conducted during the first semester of the academic year. Generalizations should therefore be made with caution and especially where settings differ in educational system, time periods, level of economic development, and even culture. A second limitation of this study is that the correlations obtained cannot establish cause-and-effect relationships between the variables correlated.

## Significance of the Study

Understanding the relationships among students' background characteristics, number of misconceptions about major, and satisfaction with major is perhaps the first step towards reducing student attrition in colleges. Findings from this study would be useful in the development of academic counseling programs for college bound students as well as orientation programs for freshmen in the College of Architecture and Engineering.

Information obtained from this study should be useful in determining the type of information and direction provided by the career planning office at the university.

Information generated by this study should be useful at the departmental level, too. Departments should be able to use findings from this study to improve their curricular so that courses are made more relevant and appealing to students. Results from this study should also be useful in the development of more effective recruitment strategies.

# CHAPTER II.

# LITERATURE REVIEW

This study attempts to establish the relationship among freshman background characteristic variables, misconceptions about major, and satisfaction with the major area of study. Different researchers have used different approaches to study students' satisfaction with their majors.

According to Bell (1974), education is a consumer service. Students, as consumers of educational services, have specific needs and wants with corresponding satisfactions (Hampton, 1983). Enis (1977) therefore contends that researchers in education need to evaluate the educational process from the students' "consumer" point of view. The concept of students as consumers is derived from a marketing orientation which argues that achieving organizational goals depends on identifying the needs and wants of target markets and delivering the desired satisfaction effectively and efficiently (Kotler, 1984).

Other researchers have based their studies in psychology and vocational counseling. They seem to suggest that personal factors, perhaps personal traits, have something to do with students' attitudes and choices in college (Terpening, Gaertner, & Pitts, 1982). Studies based in psychology tend to emphasize environmental or social factors, academic factors, and vocational orientation factors in their explanation of students' satisfaction with majors.

In this chapter, theoretical issues are first discussed. Literature on students' satisfaction with major and misconceptions about major is then reviewed.

## Theoretical Orientation

This research is nested within the arguments presented by Rosenberg and Hovland (1960) in their conceptualization of attitude. Earlier, Allport (1935) had formulated a classic

definition of attitude. Attitude, Allport (1935) asserted, is a neutral mental state of readiness to respond that is gradually achieved through certain experiences. Once fully achieved, this state of mind exerts a dynamic influence over human behavior.

A broader conceptualization of attitude was presented by Rosenberg and Hovland (1960) in what has come to be known as the tri-component view of attitude. According to Rosenberg and Hovland (1960), attitude is a predisposition to respond to some external stimuli. The external stimuli could be situations, social issues, or experiences. The response has three dimensions: the cognitive, the affective, and the behavioral. These are the three components of attitude.

In the context of this research, the cognitive dimension of attitude refers to the students beliefs or perceptions about the major areas of study. According to Rosenberg and Hovland (1960), the cognitive domain of attitude can be inferred from verbal statements of beliefs. Students' perceptions about workload, the level of difficulty, career preparation, and academic quality are examples of the cognitive dimension of attitude. In this research, misconceptions about major represent the cognitive domain.

The affective domain of attitude involves the sympathetic nervous system; it represents a person's likes or dislikes (Rosenberg & Hovland, 1960). The affective domain too could be inferred from verbal statements of how much one likes or dislikes something. Students' evaluation of their major represents the affective component of attitude. In this study, students evaluate various aspects of their majors (e.g., relevance of subject matter, career preparation, length of program) and indicate their level of satisfaction. Those who like their majors are expected to have higher levels of satisfaction, whereas those who dislike their majors would display lower levels of satisfaction. Students' satisfaction with major therefore represents the affective component of attitude. This is consistent with the argument forwarded by Conant, Brown and Mwokwa (1985) that, operationally, satisfaction is

considered similar to conventional definitions of attitude only that it is situation specific rather than enduring.

The behavioral component of attitude refers to a person's actions or intentions toward the attitude object. A student's choice, enrollment, and commitment to a specific major area of study in college represent the behavioral component of attitude.

Rosenberg and Hovland (1965) further argued that the cognitive and affective domains of attitude are organized in some congruence with one another. Under certain conditions, a change in the affective domain would result in a corresponding change in the cognitive domain. To achieve equilibrium, the behavioral dimension must also change. It is argued in this research that a relationship exists between misconceptions and satisfaction with major. Further, since attitude is a predisposition to respond to some external stimuli, the independent variables are hypothesized to be the external stimuli.

## Satisfaction with Major

From a marketing orientation, Engel and Blackwell (1982) have defined satisfaction as "an evaluation that the chosen alternative is consistent with prior beliefs with respect to that alternative" (p 501). When the chosen alternative is not consistent with prior beliefs and expectations, the outcome is dissatisfaction. Engel, Blackwell, and Miniard (1986) further state that a set of beliefs about a given option is a kind of hypothesis. Subsequent evaluation of the option serves to verify or reject the hypothesis. If verified, these beliefs will lead to higher levels of satisfaction with the chosen option. Hampton (1983) further observes that satisfied students are not only likely to complete their programs but they are also likely to attract new students to the institution.

A number of researchers have investigated the factors that influence students' satisfaction with their majors. Some studies indicate that occupation orientation is a

significant predictor of satisfaction with major (Morgan & Shim, 1990; Shim & Morgan, 1990; Terpening et al., 1982). Using six categories, Morgan and Shim (1990), found that students oriented towards managerial and sales occupations were more satisfied compared to students interested in artistic-fashion, social, investigative, artistic-interior, or conventional occupations. There is also a relationship between students' major department and the way they evaluate their major areas of study. Morgan and Shim (1990) found significant differences in satisfaction with major among students in four departments: merchandising, apparel design, interior design, and consumer science. These differences are perhaps due to the differences in occupational orientations of the students within the different departments.

Research on gender differences in satisfaction with major is rather scarce. In one study Shim and Morgan (1990) concluded that students' demographic characteristics such as age, gender, marital status, and GPA did not have a significant influence on positive attitudes toward the major area of study. However, Shim, Morgan, and Oltjenbruns (1991) found gender to be a significant predictor of satisfaction with both the quality of instruction and career opportunities within the major. Similarly, Hearn (1985) concluded that the process of satisfaction formation is not uniform for male and female college students.

The influence of various persons on the decision to major in a particular area has too been found to affect satisfaction with major (Morgan & Shim, 1990; Shim et al., 1991; Terpening et al., 1982). Morgan and Shim (1990) investigated the effect of social and self influences on satisfaction with major. Social and self influences were operationalized as friends, parents, relatives, employers, professors, and self. Results indicated that students who were self influenced tended to be more satisfied with their majors than those influenced by friends, parents or relatives, employers, professors or advisors. Social influences also appeared to be related to the selection of the major. For example, Merchandising students reported to be more influenced by their employers whereas apparel design students were more

influenced by self-decision (Morgan & Shim, 1990). This finding leads to an important recruiting implication regarding where to disseminate important information about the major department.

Shim et al. (1991) also investigated the effect of parents'/friends' influence in choosing a major on satisfaction. Results indicated that parental influence on choosing a major affected satisfaction with quality of instruction and career opportunities.

Tarpening et al. (1982) had earlier concluded that peer influence did not affect attitude or choice of a major. Family influence, however, was found to have a negative influence on attitude towards a major in management. Family influence was also found to have a negative impact on the choice of a marketing major but a positive effect on the choice of an accounting major.

In a causal model describing the process of dropping out of college, Tinto (1975) argued that a student's propensity to complete college is related to how well the student integrates into the academic and social systems of the college. A number of programs have been developed to help students achieve a smoother transition into the college environment. Academic advising programs and orientation programs are perhaps the most common systems of disseminating information about college to students. In addition, students intending to enter colleges can obtain information on colleges and majors by visiting the institutions or from college catalogs.

Landis (1976) has discussed academic advising and its relationship to the retention of minority students in engineering programs. Academic advising helps in monitoring student academic progress, providing an outlet for personal counseling, establishing and developing career interests, and creating a positive, success oriented environment especially for the minority student. This, Jaffe (1989) contends, may lead to student satisfaction and academic success.

Similarly, orientation programs equip students with the information they need to start a challenging college career. But unlike academic advising which concentrates on providing students with information on courses and majors, orientation programs tend to provide students with information on the social aspects of college life as well as information on institutional expectations, policies, and procedures.

In their work on communication campaigns, McCombs and Shaw (1972) have demonstrated the power of information in influencing public opinion. Similarly, Rogers and Storey, (1987) from years of communication research, have summarized their generalizations of the effects of new information on public behavior. Effective communication campaigns, they concluded, create awareness, trigger interpersonal discussion, encourage mass participation and rely on peer network communication to initiate and sustain change in attitude and behavior. Engel and Blackwell (1982) have also observed that "new information does affect the consumer's cognitive structure and leads to a change in evaluative criteria under some circumstances in beliefs, attitudes, and intentions," (p 442). The more the students are informed about college majors the more satisfied they are likely to be with their chosen majors.

## Misconceptions about Major

A misconception is an idea or interpretation that is inaccurate or contradicts scientific knowledge. Mahadeva (1989) however argues that a misconception has a more technical meaning; it is an alternative framework. Driver and Easley (1973) insist that the term misconception should be used when students have been exposed to formal models, prior knowledge, or theories and have assimilated then incorrectly whereas, alternative framework should be used when students have developed autonomous frameworks for conceptualizing their experiences of the world around them. Alternative framework then is analogous to a

hypothesis which students can, using the scientific method, falsify through observations (Driver & Easley, 1973). Misconceptions, on the other hand comprise false prior knowledge and perceptions which could only be removed through a conceptual change (Brown & Clement, 1989). In this study, misconceptions are conceptualized as false prior knowledge and perceptions about majors.

Most of the misconceptions about majors commonly held by students relate to level of difficulty, job opportunities, and poor image of the major, among many others (Stone, 1993; Whigham, 1985). Writing on vocational education, Stone (1993), identified several misconceptions commonly held by students. Vocational education, Stone (1993) stated, is perceived by many students as a poor investment, dull, and a block to further education and academic competence. Blening (1986) has discussed five false assumptions that students tend to make regarding careers. Students tend to confuse job opportunities with promotion. According to Blening (1986), there are other concerns in a career; for example, job satisfaction, personal growth and development of new skills. Perhaps in addition to promotions, students should consider these other factors when they evaluate the type of careers their majors are preparing them for.

Various approaches of overcoming misconceptions have been proposed (Brown & Clement, 1989; Dreyfus, Jungwirth & Eliovitch, 1990; Wandersee, 1985). The common denominator in most of these approaches is the assumption that students possess some prior knowledge which, though inaccurate, could be used as a bridge to new knowledge. The idea of using prior knowledge to overcome students misconceptions is based on Ausubel's (1968) assimilation theory of cognitive learning and its subsequent elaboration by Novak (1977). The principal assumptions in this theory are that concepts are observed regularities among facts, that meaningful concept formation only occurs when a learner consciously attempts to relate new knowledge in a substantive way to concepts which exist in the learner's cognitive

structure, and that meaningful concept learning is the goal of science education since thinking requires the existence of concepts (Ausubel, 1968).

Dissemination of information is the key to overcoming students' misconceptions about college majors. By examining what students believe before disseminating any new information to them, greater meaningful learning might occur. It is therefore necessary that students are made aware of their misconceptions about majors during academic counseling or orientation programs.

# CHAPTER III.

# METHODOLOGY

The purpose of this study is to examine the relationships among freshman background characteristic variables, number of misconceptions with major, and satisfaction with major area of study in the college of Architecture and engineering at the University of Nairobi. This section describes the characteristics of the subjects, instrument, procedures, and data analysis methods.

## Subjects

It was initially intended that all the freshmen in the eight departments of the College of Architecture and Engineering at the University of Nairobi be included in the study. According to the university records there were 336 freshmen registered for degree programs in the College of Architecture and Engineering. However, two departments were excluded from the study because the focus of their degree programs was outside architecture and engineering. This reduced the number of possible participants to 276. The final sample consisted of 261 respondents from six departments in the college. These freshmen came from 110 different high schools. Table 1 shows the enrollment pattern of the subjects. Most of the freshmen were in the department of Civil Engineering (24.9%). The department of Building Economics had the least number of freshmen (11.9%).

The age range for the whole group was 18-24 years with a mean of 19.8 years. The ratio of females to males was approximately one to ten with at least one female in each department.

An index of qualitative variation (IQV) was computed for the distribution of males and females among the six departments. The computed IQV values were 0.962 for the distribution of females and 0.978 for the distribution of males. These values indicate very even spreads for both distributions with males having a slightly more even spread among the departments compared to females. The computed IQV for the distribution of males and females in the sample was very small (0.117) reflecting the large proportion of males compared to females.

Table 1. Frequency distribution of freshmen by major

| Department | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | n | (%) |
| Land Economics | 6 | 26.09 | 26 | 10.92 | 32 | 12.26 |
| Building Economics | 3 | 13.04 | 28 | 11.77 | 31 | 11.88 |
| Architecture | 5 | 21.74 | 29 | 12.18 | 34 | 13.05 |
| Civil Engineering | 3 | 13.04 | 62 | 26.05 | 65 | 24.90 |
| Mechanical Engineering | 1 | 4.35 | 44 | 18.49 | 45 | 17.24 |
| Electrical Engineering | 5 | 21.74 | 49 | 20.59 | 54 | 20.69 |
| Total | 23 | 100 | 238 | 100 | 261 | 100 |

Respondents' average scores in the national examination ranged from C+ to A- as shown in Table 2. Most of the freshmen (42.5%) had scored an average of B. The index of qualitative variation for this distribution was computed as 0.836. Surprisingly, no student had scored an average of A in the national examination.

## Instrument

The instrument used in this study was developed by the researcher in the spring of 1992 (see Appendix A). The instrument is divided into eight sections. Sections one through

four and section seven were used in this study. Sections five, six and eight do not pertain to the current study.

Section one of the instrument covers the subject's background information such as major department, age, sex, student population in the subject's former high school, and average score in the national examination. Section two taps information regarding student's sources of information on university programs. Students were asked to indicate if they had heard talks on university programs prior to joining college, whether they had previously read the university catalog, and whether they had sought information from the departments prior to joining college. Students were also requested to indicate the most influential source in the selection of their major department and whether they had a relative or family friend who possessed a degree in architecture or engineering.

Table 2. Subjects' average scores in the national examination

| Variable | | n | % |
|---|---|---|---|
| Grade | C+ | 5 | 2.00 |
| | B- | 37 | 14.86 |
| | B | 106 | 42.57 |
| | B+ | 88 | 35.35 |
| | A- | 13 | 5.22 |
| Total | | 249 | 100 |

Section three consists of eight items intended to measure the students' perception of the completeness of information discussed by the department during orientation. The items relate to the following topics: definition of the degree program, employment opportunities after graduation, available professional clubs, requirements regarding classes, examination procedures, available libraries, and where to go for academic counseling. The students'

responses are either fully discussed (3), partially discussed (2), or not discussed (1). The items were added together to form a scale.

Section four of the instrument includes ten commonly held misconceptions about majors in architecture and engineering. The statements relate to the following general themes: anxiety towards mathematics, expectations in employment and salary scales after graduation, Program difficulty and length, relevance of courses, gender bias, failure rate among architecture and engineering majors, and participation of architecture and engineering majors in social functions. The statements are both negatively and positively worded. Students responses are either agree (1) or disagree (2). After the appropriate recoding, items were added to form a scale.

Section seven pertains to students' satisfaction with majors. The eight items in this section were added together to form the satisfaction scale. A 4-point scale was used to measure satisfaction with major, i.e., very dissatisfied (1), dissatisfied (2), satisfied (3), and very satisfied (4). Items in this section referred to: employment opportunities after graduation, length of degree program, opportunities for graduate studies within the major, availability of departmental libraries, workshops, and computer laboratories, relevance of major to national development, career preparation, status, and relevance of current courses to major.

Items included in the instrument were all generated by the researcher. They were modified several times before administration. However, the instrument was not validated by experts, judges, or by any other method.

## Procedures

A pilot study was done among ten non-participants to determine the length of time required to complete the questionnaire and the clarity of the items. It took the students

approximately 25 minutes to complete the whole questionnaire. Minor modifications were made to some of the items based on the students' observations. The administration of the final instrument was done in March of 1992. The questionnaires were distributed to students during classes. Completed questionnaires were returned the same day. The purpose of the survey was explained to the students prior to the distribution of the questionnaires; the students were assured that participation in the study was voluntary and their responses would be anonymous and confidential. This research was approved by the University of Nairobi in conjunction with the Office of the President after establishing that the rights of the participants were adequately protected. The study was also approved by the Iowa State Human Subjects Review Committee.

## Data Analysis

Data were coded and key punched into the main frame computer at Iowa State University. Data were then cleaned after running the initial frequencies.

Data were analyzed using version 4.0 of the Statistical Package for Social Sciences (SPSS). Descriptive statistics including means, modes, and standard deviations were computed for all the variables in the study. Cases with missing data were omitted from the analysis. Reliability tests were run on the three scales created namely: satisfaction with major, misconceptions about major and perception of the completeness of information on major provided by the departments during orientation.

The hypothesized relationships were tested using pearson product-moment correlation, independent t-test, and one way analysis of variance. Rejection of the null hypotheses was based on a one tail test with a statistical significance level of $p \leq .05$.

# CHAPTER IV.

# RESULTS

This chapter presents the results of the statistical analysis of the data. There were a total of 261 respondents in this study. Respondents were all freshmen enrolled in six departments in the College of Architecture and Engineering, University of Nairobi.

The first section of this chapter presents descriptive statistics of the main variables in the study. The satisfaction, perception, and misconceptions indices are then developed. The last section presents the results of the hypotheses testing.

## Item Frequencies

Attendance to talks on university programs

About 43% of the respondents had attended talks on university programs when they were in high school. Only half of these indicated that the talks they attended were specifically on programs in engineering and architecture (Table 3).

Respondents who attended a talk on university programs were asked to indicate the person who gave the talk and only about half responded. About 70% of those who responded had attended a talk given by a school headmaster, teacher, or former student. About a third attended a talk given by a university official, career master, or a professional in architecture or engineering.

Reference to university catalog

About 23% of the respondents indicated that they had seen the university catalog prior to selecting their majors. However, only 18% of all respondents indicated that they had actually read the catalog. Perhaps a majority of students out there do not know that a

Table 3. Frequency of use of main sources of information

| Item | n (Responding) | n (yes) | % (yes) |
|---|---|---|---|
| Attend talk on general university programs | 261 | 112 | 42.90 |
| Attend talk on engineering and architecture programs | 110 | 50 | 45.50 |
| Seen catalog | 261 | 61 | 23.40 |
| Read catalog | 61 | 47 | 77.10 |
| Seek information from department | 261 | 22 | 8.40 |
| Have a relative/family member in the same field | 261 | 84 | 32.20 |

university catalog is a source of information on university programs and if they do, they probably do not know where to obtain one.

Prior visits to major departments

Only about eight percent of the freshmen indicated that they had visited their departments prior to selecting their majors. Majority of the freshmen, it seems, do not seek any information from the departments prior to joining the university.

Relative or family member in the same field.

Majority of the students indicated that they did not have a relative or family member who had a degree in engineering or architecture. This was somewhat unexpected because previous research has detected a relationship between students' major area of study and having friends or relatives in the same field (Hafer & Schank, 1982).

Source of influence in selecting major

Table 4 shows sources of influence in selecting the major cited by the students. Over three quarters indicated that they chose the major out of their own interest rather than due to influence from somebody else. Surprisingly, a high school career guide was the least cited as a source of influence in selecting the major, yet it would be expected that a career guide would be the person most likely to be consulted by high school students as they ponder over which major to select.

Table 4. Source of influence in selecting the major

| Variable | n | % |
|---|---|---|
| Most Influential Person | | |
| Self-influenced | 195 | 78.00 |
| High School Teacher | 20 | 8.00 |
| Friend | 15 | 6.00 |
| Parents | 8 | 3.20 |
| Relative | 5 | 2.00 |
| Brother/Sister | 4 | 1.60 |
| School Chaplain | 2 | 0.80 |
| Career Master | 1 | 0.40 |
| Total | 250 | 100 |

## Index Development

Satisfaction with major

Items 55 through 62 in the questionnaire were used to assess students' satisfaction with various aspects of their degree programs. A 4-point scale was used for the items. The means and standard deviation for each of the eight items are given in Table 6. The highest satisfaction was with career preparation ($\bar{x}$ = 3.35), whereas the lowest satisfaction was with the quality of teaching and learning facilities ($\bar{x}$ = 2.20).

A satisfaction index was created by summing up students' scores on the eight items. The possible range was eight through thirty-two. The overall mean of the satisfaction scale was 22.4 with a standard deviation of 3.6. Scores ranged from 8 through 31.

A reliability test was run to determine the internal consistency of the satisfaction scale. The reliability test produced a coefficient alpha of .6817. Items relating to length of program and relevance of major to national development had small inter-item correlations (.2965 and .2600 respectively). Deletion of these two items however, would not have resulted in any increase in the overall coefficient alpha.

Table 5. Satisfaction with major (N = 261)

| Item Description | Mean | SD |
|---|---|---|
| Career preparation | 3.35 | 0.71 |
| Status of major relative to other majors | 3.25 | 0.74 |
| Relevance of major to national development | 3.23 | 0.66 |
| Employment opportunities | 2.78 | 0.81 |
| Length of program | 2.56 | 0.89 |
| Relevance of current courses to major | 2.53 | 0.88 |
| Opportunities for graduate studies in major | 2.51 | 0.85 |
| Teaching/learning facilities | 2.20 | 0.89 |

Scale: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Satisfied, 4 = Very Satisfied

Number of misconceptions about major

Items 26 through 35 in the questionnaire were used to assess students' number of misconceptions with major. Items 27, 29, 32 and 34 were positively worded and were recoded to negative. A student who agreed with each negative statement was scored a 1 and those who disagreed with each negative statement scored a zero.

Preliminary analysis on the misconception scale indicated a low reliability. The coefficient alpha was computed as 0.3798. The small coefficient could be explained by the small inter-item correlations of the items used in the scale. The items do not seem to represent misconception as an underlying construct; they are independent of each other. For the purposes of this study, this variable will therefore be defined as the number of misconceptions about architecture and engineering majors.

The frequency distributions show that 87% of the students held the misconception that graduates in architecture and engineering earn much higher salaries than graduates from other programs. Three quarters of the respondents had the notion that programs in architecture and engineering are more difficult than other degree programs. Most students (83.1%) however agreed that architecture and engineering programs are suitable to both males and females (Table 6).

The number of misconceptions for each student was obtained by summing up the scores across the ten items. The possible range was zero through ten. The overall mean of this scale was 2.94 and the standard deviation was 1.42. Scores ranged from zero to six.

Perception of completeness of information provided by departments

Eight items were used to assess students' perception of the completeness of information provided by their departments during orientation. The items used were questions 19 through 25. A 3-point scale was used for the items. Table 7 shows the means and standard deviations for each of the eight items.

The results indicate that the areas least discussed by the departments were employment opportunities after graduation and the available national professional bodies which students could join. The most discussed topics were course requirements and examination procedures within the major departments.

Table 6. Number of misconceptions about major (N = 260)

| Statement | n agree | % agree |
|---|---|---|
| Graduates in Engineering earn higher salaries than graduates in other programs | 227 | 87.30 |
| Programs in Engineering are much more difficult | 200 | 76.90 |
| Programs in Engineering involve complex mathematical concepts | 137 | 52.70 |
| Majors in Engineering shun social functions | 137 | 52.70 |
| Failure rate is high in Engineering programs | 103 | 39.77* |
| Courses are not relevant to major | 93 | 35.80 |
| Programs take long to complete | 93 | 35.80 |
| Most time is spent designing | 83 | 31.90 |
| Employment opportunities are few for graduates | 72 | 27.70 |
| Programs are not suitable for both sexes | 44 | 16.90 |

Scale: Agree = 1, Disagree = 0 * N = 259

A perception index was developed by summing up students' scores on the eight items. The possible range was eight to 24. The overall mean of the perception scale was 15.0 and the standard deviation was 2.9. Scores ranged from eight to 22.

A reliability test was run to determine the internal consistency of the scale. The computed coefficient alpha was .60. Item Q25 (where to go for academic counseling) had a small inter-item correlation. Deletion of this item from the scale would have resulted in an increase of only .01 in the overall coefficient alpha, a magnitude not considered large enough to warrant the omission of this item from the scale.

Table 7. Perception of completeness of information (N = 256)

| Item | Mean | SD |
|---|---|---|
| Class/course requirements within major | 2.31 | 0.75 |
| Examination procedures and requirements | 2.15 | 0.74 |
| Where to go for academic counseling | 2.01 | 0.78 |
| Definition of degree program | 1.97 | 0.65 |
| Libraries within the city | 1.85 | 0.79 |
| Students' professional bodies available | 1.84 | 0.72 |
| Professional bodies available nationally | 1.53 | 0.68 |
| Employment opportunities | 1.38 | 0.59 |

Scale: Not Discussed = 1, Partially Discussed = 2, Fully Discussed = 3.

## Testing the Null Hypotheses

Seventeen null hypotheses were tested in this study. The results of the hypotheses testing are presented in this section.

**Null Hypothesis One: There is no significant relationship between satisfaction with college major and number of misconceptions about major.**

To test this hypothesis, students' scores on the satisfaction index were correlated with scores on the misconception index. A weak but significant negative relationship was found between the variables ($r = -.2709$, $p \leq .01$). This suggests that students with fewer number of misconceptions about the major tend to be more satisfied with their major. The null hypotheses was therefore rejected.

**Null Hypothesis Two: There is no significant relationship between satisfaction with college major and perception of completeness of information on major given by the department.**

This hypothesis was tested by correlating students' scores on the satisfaction index with scores on perception of completeness of information index. A weak but significant

positive relationship was found between the variables ($r = 0.1696$, $p \leq .01$). Students who perceive that the information on major provided by their department is complete tend to be more satisfied with the major. The null hypothesis was rejected.

**Null Hypothesis Three: There is no significant relationship between satisfaction with major and average score in the national examination.**

This hypothesis was tested by correlating students' scores on the satisfaction index with scores obtained in the national examination. There was no significant relationship between the variables ($r = -.0586$, $p \geq 0.05$). Students who obtain higher scores in the national examination are not necessarily more satisfied with their majors than students who score less. Thus, the null hypothesis was not rejected.

**Null Hypothesis Four: There is no significant difference between males and females, in their satisfaction with major.**

To test this hypothesis, satisfaction mean scores were computed for both males and females. To compare the two means, an independent t-test statistic was computed. The t-test result indicated that the level of satisfaction with major is the same for both males and females (Table 8). The null hypothesis was not rejected.

Table 8. Gender differences in relation to students' satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Females | 23 | 23.3913 | 3.086 | -1.39 | 259 | .165 |
| Males | 238 | 22.2983 | 3.640 | | | |

**Null Hypothesis Five: There is no significant difference among students from different departments, in their satisfaction with major.**

This hypothesis was tested by performing a one-way analysis of variance (ANOVA). The analysis of variance did not produce significant results ($F$ (5,255) = .5162, $p = .5112$).

Table 9. Mean scores on satisfaction with major by department (N = 261)

| Group | Mean | SD | n |
|---|---|---|---|
| Building Economics | 23.50 | 3.50 | 31 |
| Land Economics | 22.70 | 3.90 | 32 |
| Architecture | 22.50 | 3.10 | 34 |
| Civil Engineering | 22.20 | 3.80 | 65 |
| Mechanical Engineering | 22.20 | 3.30 | 45 |
| Electrical Engineering | 21.90 | 3.70 | 54 |

Satisfaction with major is the same, on average, for all students regardless of their major department (Table 9). The null hypothesis was not rejected.

**Null Hypothesis Six: Students' satisfaction with major does not differ significantly by the main source of influence in selecting the major.**

To test this hypothesis, a one-way analysis of variance (ANOVA) was performed. The analysis of variance results did not indicate significant differences ($F$ (5,241) = 1.116, p = .3548). Table 10 shows the results of the ANOVA. On average, students are equally satisfied regardless of the main source of influence in selecting the major. The null hypothesis was not rejected. This result is not surprising given the overwhelming number of students who indicated that the decision to join a particular program was their own resulting in small frequencies in the other cells. There is also a strong violation of the assumption of homogeneity of variance. This makes the analysis rather unreliable.

To improve the analysis, some groups were combined. Those who were influenced by relative, parents, high school teacher, brother/sister, and friend were grouped as "others" and compared to those who were "self-influenced." The t-test result did not indicate any significant differences between the mean satisfaction scores of those who were self-influenced and those who were influenced by others (Table 11).

Table 10. Mean scores on satisfaction with major by the main source of influence in selecting the major (N = 250)

| Group | Mean | SD | n |
|---|---|---|---|
| Relative | 22.80 | 2.50 | 5 |
| Parents | 22.60 | 3.10 | 8 |
| Own interest | 22.60 | 3.50 | 195 |
| High school teacher | 22.15 | 3.40 | 23 |
| Brother/sister | 21.00 | 7.10 | 4 |
| Friend | 20.50 | 3.70 | 15 |

Table 11. Source of influence in relation to satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Self-influenced | 195 | 22.6 | 3.5 | 1.6 | 249 | .063 |
| Others | 55 | 21.7 | 3.7 | | | |

**Null Hypothesis Seven: There is no significant difference between students who have attended talks on university programs and those who have not attended talks on university programs, in their satisfaction with major.**

An independent t-test statistic was computed on mean satisfaction scores of those who attended talks and those who did not attend talks. The difference between the two means was not statistically significant (Table 12). The null hypothesis was not rejected.

Table 12. Attendance to talks on university programs in relation to satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not attend talks | 148 | 22.3557 | 3.541 | -.200 | 259 | .841 |
| Attended talks | 112 | 22.4464 | 3.481 | | | |

**Null Hypothesis Eight: There is no significant difference between students who previously sought information from the departments and those who did not seek information from the departments, in their satisfaction with major.**

This hypothesis was tested by computing an independent t-test statistic on the satisfaction mean scores of both groups. As shown in Table 13, the difference between the two groups on the satisfaction variable was not statistically significant. A high level of satisfaction is not necessarily associated with seeking information from the department. The null hypothesis was not rejected.

Table 13. Seeking information from the department in relation to satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not seek information | 238 | 22.4426 | 3.494 | -.320 | 259 | .375 |
| Sought information | 22 | 22.0909 | 4.710 | | | |

**Null Hypothesis Nine: There is no significant difference between students who read the university catalog and those who do not read the university catalog, in their satisfaction with major.**

An independent t-test statistic was computed on the mean satisfaction scores for both groups. The difference between the two groups was statistically significant (Table 14). Those who had read the university catalog were more satisfied with their majors than those who had not read the university catalog.

Table 14. Reading university catalog in relation to satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not read catalog | 214 | 22.1636 | 3.599 | -2.23* | 259 | .014 |
| Read catalog | 47 | 23.4468 | 3.463 | | | |

* $p < .05$

**Null Hypothesis Ten: There is no significant difference between students with a relative or family member who has a degree in the same field and those who have no relative or family member who has a degree in the same field, in their satisfaction with major.**

An independent t-test statistic was computed on the satisfaction mean scores of both groups. As shown in Table 15, the difference between the satisfaction mean scores of both groups was not statistically significant. The level of satisfaction with major is not related to having a relative or family member who has a degree in the same field.

Table 15. Having a relative or family member who has a degree in the same field in relation to satisfaction with major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| No family member/ relative in same field | 177 | 22.4689 | 3.553 | .48 | 259 | .315 |
| Has family member/ relative in same field | 84 | 22.2381 | 3.712 | | | |

**Null Hypothesis Eleven: There is no significant relationship between the number of misconceptions about majors and perception of the completeness of information about major provided by the department.**

To test this hypothesis, students' scores on the number of misconception index were correlated with scores on the perception of the completeness of information index. Results did not indicate any significant relationship between the two variables ($r = -0.1007$, $p \geq .05$). Students who perceive that their departments have provided them with complete information about the major do not necessarily tend to have fewer number of misconceptions about their majors. The null hypothesis was not rejected. Perhaps the departments dwell more on technical information about the structure of the programs and less on general information about the majors such as earning capacity of graduates or program difficulty in which students tend to have more misconceptions.

**Null Hypothesis Twelve: There is no significant difference between males and females, in the number of misconceptions about majors.**

The computed t-test statistic between the mean scores of the number of misconception index for the two groups was not statistically significant (Table 16). The number of misconceptions about majors and gender are not associated. The null hypothesis was not rejected.

Table 16. Gender differences in relation to number of misconceptions about major

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Male | 237 | 2.9325 | 1.410 | -.08 | 258 | .469 |
| Female | 23 | 2.9565 | 1.551 | | | |

**Null Hypothesis Thirteen: There is no significant difference between students who have attended talks on university programs and those who have not attended talks on university programs, in the number of misconceptions about majors.**

To test this null hypothesis, an independent t-test statistic was computed on the mean scores of the number of the misconception index for both groups. The difference between the mean scores for both groups was statistically significant as shown in Table 17. Having attended a talk on university programs is associated with fewer misconceptions about majors. The null hypothesis was rejected.

Table 17. Attendance to talks on university programs in relation to misconceptions about majors

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not attend talks | 148 | 3.1216 | 1.447 | 2.47* | 258 | 0.007 |
| Attended talks | 112 | 2.6875 | 1.349 | | | |

* $p < .05$

**Null Hypothesis Fourteen: There is no significant difference between students who previously sought information from the departments and those who did not seek information from the departments, in the number of misconceptions about majors.**

An independent t-test statistic was computed on the mean scores of the number of misconception index for both groups. Results indicated that mean scores for the two groups were not significantly different. (Table 18.) A prior visit to the department for information is not necessarily associated with fewer misconceptions about the major. The null hypothesis was not rejected. Once again, the information provided by the department may be more related to the structure of the programs rather than on areas in which students tend to have more misconceptions.

Table 18. Seeking information from the department in relation to misconceptions about majors

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not seek information | 238 | 2.9244 | 1.397 | -.38 | 258 | .351 |
| Sought information | 22 | 3.0455 | 1.676 | | | |

**Null Hypothesis Fifteen: There is no significant difference between students who read the university catalog and those who did not read the university catalog, in the number of misconceptions about majors.**

Results of the independent t-test statistic computed to test this hypothesis indicated no significant difference between the two groups (Table 19). Reading the university catalog is not necessarily associated with fewer misconceptions about the major. The null hypothesis was not rejected.

Table 19. Reading university catalog in relation to misconceptions about majors

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| Did not read catalog | 213 | 2.9437 | 1.453 | .22 | 258 | .414 |
| Read catalog | 47 | 2.8936 | 1.272 | | | |

**Null Hypothesis Sixteen: There is no significant difference between students with a relative or family member who has a degree in the same field and those who have no relative or family member who has a degree in the same field, in the number of misconceptions about majors.**

To test this null hypothesis, an independent t-test statistic was computed on the mean scores of the number of misconception index for both groups. The difference between the mean scores for both groups was not statistically significant as shown in Table 20. Having a relative or family member with a degree in the same field is not related to fewer misconceptions about majors. The null hypothesis was not rejected.

Table 20. Having a relative or family member who has a degree in the same field in relation to misconceptions about majors

| Group | n | Mean | SD | t-value | df | One-tail Prob. |
|---|---|---|---|---|---|---|
| No family member/relative in same field | 176 | 2.9261 | 1.377 | -.14 | 258 | .445 |
| Has family member/relative in same field | 84 | 2.9524 | 1.512 | | | |

**Null Hypothesis Seventeen: There is no significant difference among students from different departments in their perception of the completeness of information provided by the department.**

To test this hypothesis, a one-way analysis of variance (ANOVA) was performed on the perception of completeness of information index. A significant difference at the .05 level

Table 21. Mean scores on the perception of the completeness of information index (N = 256)

| Group | Mean | SD | n |
|---|---|---|---|
| Architecture | 16.50 | 2.20 | 34 |
| Building Economics | 16.40 | 3.20 | 31 |
| Land Economics | 15.40 | 2.70 | 31 |
| Mechanical Engineering | 15.10 | 3.10 | 42 |
| Civil Engineering | 14.40 | 2.80 | 65 |
| Electrical Engineering | 13.90 | 2.80 | 53 |

was found between groups ($F$ (5,250) = 6.03, p = .000). The null hypothesis was rejected. Table 21 shows the group means.

A Schaffe test was done to determine which groups are significantly different. Results indicated that perception about completeness of information differed significantly between departments as shown in Table 22. This result may be an indication of poor implementation of the orientation program at the departmental level especially for the Electrical and Civil Engineering departments.

Table 22. Schaffe results for the perception of the completeness of information index (N = 256)

| | Groups | | | | | |
|---|---|---|---|---|---|---|
| Groups | 1 | 2 | 3 | 4 | 5 | 6 |
| Architecture | | | | | | |
| Building Economics | | | | | | |
| Land Economics | | | | | | |
| Mechanical Engineering | | | | | | |
| Civil Engineering | * | | | | | |
| Electrical Engineering | * | * | | | | |

* $p < .05$

## Summary

This chapter presented the statistical analysis of the data. First, frequency distributions and summary statistics for all the variables in the study were presented. Three scales on the number of misconceptions, satisfaction and perception were then developed. Finally, the results of the statistical procedures used to test the null hypotheses were presented.

Significant relationships were found between satisfaction with major and number of misconceptions about major, perception of completeness of information provided by the department, and reading university catalog. Similarly, there were significant relationships between the number of misconceptions about major and attendance to talks on university programs and between perception of completeness of information provided by the department and the student's major department.

# CHAPTER V.

## DISCUSSION AND CONCLUSION

The primary purpose of this study was to examine the relationships among freshman background characteristic variables, number of misconceptions about major, and satisfaction with major area of study. The study site was the College of Architecture and Engineering, University of Nairobi. Two hundred and sixty-one freshmen in six departments responded to the survey.

Descriptive statistics were computed on all the variables in the study. Seventeen null hypotheses were tested using t-test, pearson product-moment correlation, and one-way analysis of variance.

Results showed that only about 10% of the sample were females. This is consistent with previous research which indicated that engineering has traditionally been dominated by males (Doigan, 1984). Although the minimum entry requirement in the university is an average grade of C+, almost all the respondents entered the university with a B- average or better in the national examination.

In a structured educational system where selecting a major is perhaps the most critical academic decision a student will ever have to make, it would reasonably be expected that university aspirants would consult all the possible sources of information first before selecting their majors. In Kenya, pre-college students can obtain information about degree programs through talks on university offerings, from the university catalog, or by visiting the departments. Results showed that of those surveyed, 43% attended talks on university programs, 18% had read the university catalog, and only eight percent visited the departments.

The three sources of information from which students would normally obtain information on degree programs at the University of Nairobi seem to be poorly utilized. The fact that not even half of the freshmen interviewed ever listened to a talk on university programs raises many questions regarding the level of academic counseling on university programs during the high school years. Similarly, it is highly questionable that students are aware of the university catalog as a source of information if, as results indicate, not even a quarter of the respondents had seen it, let alone read it. Even more discouraging is the fact that hardly a tenth of the respondents seemed to have been aware that important information on university programs could be obtained directly from the departments.

The relationship between satisfaction with major and the number of misconceptions about the major was investigated. A weak but significant negative relationship was found between the two variables. This seems to support the theory that the cognitive and the affective components of attitude are organized in some congruence with one another (Rosenberg and Hovland, 1960). The finding stresses the importance of providing students with information on university programs before they make their selection. This reasoning is based on the assumption that ill-informed students will have the highest number of misconceptions about their majors and are therefore the most likely to drop out of college.

Further, the influence of each of the three sources of information (talks, catalog, and departmental visits) was examined. Students who had read the university catalog were more satisfied than students who had not read the catalog. Similarly, students who attended talks had fewer number of misconceptions compared to students who did not attend any talks. These two findings support the contention that new information affects people's beliefs and perceptions and hence their satisfaction with specific objects or situations (Engel & Blackwell, 1982; Jaffe, 1989; McCombs & Shaw, 1972; Rogers & Storey, 1987).

The relationships between reading university catalog and satisfaction with major may tempt one to postulate that talks tend to provide students with more general and peripheral information about university majors whereas the catalogs provide more specific details about the structure of each program. It seems that misconceptions comprise inaccurate generalizations and perceptions about what exists and removing them would require the provision of more general but accurate information such as is provided in talks (Brown & Clemet, 1989). Satisfaction tends to be related to specific aspects of the program and hence more specific information about the structure of each program such as that provided by the catalog would lead to higher levels of satisfaction.

It was surprising that having relatives or friends with a degree in the same field did not have significant relationships with satisfaction with major or with the number of misconceptions about major. Also, there was no significant relationship between the most influential person in selecting the major and satisfaction with major. This finding is not consistent with that of Morgan and Shim (1990) in which self-influenced students were found to be more satisfied than those influenced by friends, parents, employers, advisors, or professors. But again this group specified only three general sources of influence (own interest, high school staff, relative and family) and over three quarters cited own interest. The impression one gets from these results is of a group that rarely consults with those who are more knowledgeable on both the university offerings and the professional careers in architecture and engineering.

However it is necessary to put a general caveat; the small sample sizes associated with some of the categories of the independent variables (i.e. gender, read catalog, prior visits to departments, and relative in the same field) make the standard errors of the dependent variables large which in turn result in small t-values. Hence it is much more difficult to reject

the null hypothesis. Lack of significant relationships in some of the hypotheses tested could perhaps be explained by this shortcoming in the data set.

Despite its low magnitude, the positive relationship between satisfaction with major and perception of the completeness of information provided by the department is also important. It implies that even where students fail to or are unable to fully consult the other three sources of information, it is still not too late for the departments to positively shape the attitudes of these students by providing them with important as well as complete information about their majors during orientation. Departments should however, provide both technical information such as the structure of the degree programs as well as the more general information about majors such as employment opportunities, etc.

In general, the results seem to suggest a causal relationship which could be useful in explaining students' perceptions about their majors and hence their likelihood of succeeding in their academic goals. Students who attend talks on university programs have less number of misconceptions. Those who have less number of misconceptions tend to be more satisfied with their majors. This means that providing information increases satisfaction with major indirectly by reducing the number of misconceptions about major. Another causal path suggested by the data is among reading university catalog, satisfaction and misconception. Those who read the university catalog tend to be more satisfied. Students who are more satisfied tend to have less number of misconceptions. Therefore reading university catalog indirectly reduces the number of misconception about major through satisfaction. These causal paths seem to suggest reciprocal causation between satisfaction with major and number of misconceptions about major.

In conclusion, findings from this study do indicate that some freshman background characteristic variables are related to students' satisfaction with their majors and the number of misconceptions they have about majors. Further, attendance to talks on university programs

and reference to the university catalog may perhaps be the main sources of information for college bound students in Kenya but few students seem to use them. The implication is that college bound students may be making critical decisions about their academic careers when poorly informed about the programs they are interested in.

Based on findings from this study, the following recommendations are made:

1. Talks on university programs should be given regularly to students in their final year of high school. These talks should preferably be given by university officials, professionals in the field, or professors.
2. The university catalogs should be made available to high schools and to public libraries where they are accessible to high school students.
3. High school students should be encouraged to visit various departments in the universities before they select their majors.
4. Orientation programs and academic advising programs at the university should be strengthened and made more effective especially at the departmental level.

Also, the need for a more comprehensive program of academic counseling is now critical at the high school level. This is more so considering the rising demand for higher education coupled with rising costs. Such a comprehensive program should be based on findings from studies focused more in the areas of academic counseling.

Student's flexibility in the choice of majors should also be given serious thought. The students could for example, be required to take common courses during the first semester before they declare their majors. This would give them time to evaluate the various programs in which they are qualified before they make their decisions. This approach would of course require major restructuring of the university education system.

The pioneering nature of this study could not have allowed detailed investigation into the quality of information provided by the three main sources. Future research in this area

should focus on assessing both the quality and quantity of such information. Such studies should also try to develop more valid and reliable measures of satisfaction and misconception with major area of study.

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# APPENDIX A

# THE SURVEY

## SECTION I

BACKGROUND INFORMATION

1. In which department are you registered?
   Department of _____

2. What is your age? _____ years.

3. Are you male or female _____

4. What is the name of the high school you attended
   _____

5. Approximately what was the total number of students in your former high school
   _____

6. Approximately how many students did the K.C.S.E. with you in your former high school? _____

7. What was your average grade in the K.C.S.E.? _____

8. Please indicate the grades you obtained in the following subjects (delete if N/A).

   1. Mathematics _____
   2. Physics _____
   3. Chemistry _____
   4. Physical Science _____
   5. Biology/Biological Sciences _____
   6. Building Construction/Drawing & Design _____
   7. Wood Work/ Metal Work/ Power Mechanics _____
   8. Electricity _____

## SECTION II

SOURCES OF INFORMATION/INFLUENCE

9. In your former high school, did you have any organized talks on the courses offered at the university? (circle)
   1. Yes **(Go to Q10)**
   8. No **(Go to Q12)**

10. If yes, did you have any specific talks on the programs offered in the College of Architecture and Engineering?
    1. Yes
    0. No
    8. N/A

11. If yes, who gave the talk? (circle)
    1. Our school teacher
    2. Our Headmaster
    3. A University official
    4. Lecturer/Prof from the College
    5. Other (Specify)
    6. N/A
    7. Don't Know

12. What were your choices of degree programs in order of priority?
    1. _____
    2. _____
    3. _____
    4. _____

13. Had you ever heard of the University Calendar before you applied for admission to the University (circle)?
    1. Yes
    8. No **(Go to Q16)**

14. If yes, had you seen the University Calendar before you applied for admission to the University? (circle)
    1. Yes
    0. No **(Go to Q16)**
    8. N/A

15. If yes, had you actually read the University Calendar before you applied for admission to the University? (circle)
    1. Yes
    0. No
    8. N/A

16. Did you ever seek any information from your current department before you applied for University admission?
    1. Yes
    0. No

17. Do you have a family member or relative who has done any degree program in Architecture, Engineering, or a Construction related field? (circle)
    1. Yes
    0. No

18. Who would you say influenced you most in selecting the degree program you are now registered for? (circle one)
    1. Your own interest
    2. University lecturer/Professor
    3. Parents
    4. Brother/Sister
    5. Relative
    6. Friend
    7. High school teacher/Head
    8. Other (Specify) _____

## SECTION III

### PERCEPTION

PLEASE INDICATE THE EXTENT TO WHICH YOU FEEL THE FOLLOWING INFORMATION WAS DISCUSSED BY YOUR DEPARTMENT/FACULTY DURING THE ORIENTATION: (CIRCLE 1,2 OR 3)

| | | Not Discussed | Partially Discussed | Fully Discussed |
|---|---|---|---|---|
| 19. | General definition of your degree program | 1 | 2 | 3 |
| 20. | Employment opportunities after graduation | 1 | 2 | 3 |
| 21. | National Professional bodies you can join | 1 | 2 | 3 |
| 22. | Students' Professional bodies | 1 | 2 | 3 |
| 22A. | Requirements regarding courses in major | 1 | 2 | 3 |
| 23. | Examination procedures and requirements | 1 | 2 | 3 |
| 24. | Libraries within Nairobi City you could use | 1 | 2 | 3 |
| 25. | Where to go for academic counseling | 1 | 2 | 3 |

## SECTION IV

MISCONCEPTIONS

STATE WHETHER YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS: (CIRCLE 1 OR 2)

| | | AGREE | DIS-AGREE |
|---|---|---|---|
| 26. | All programs in the College of Architecture and Engineering involve complex mathematical concepts | 1 | 2 |
| 27. | I do not expect graduates from the College of Architecture and Engineering to earn much higher salaries than graduates from other programs | 1 | 2 |
| 28. | Programs in the College of Architecture and Engineering are generally more difficulty than other degree programs in the University | 1 | 2 |
| 29. | After completion, graduates from the College of Architecture and Engineering may work in many sectors of the economy | 1 | 2 |
| 30. | Students from the College of Architecture and Engineering do not participate in social functions as much as other University students | 1 | 2 |
| 31. | The subjects I am currently doing do not seem relevant to my degree program | 1 | 2 |
| 32. | Programs in the College of Architecture and Engineering are suitable to both male and female students | 1 | 2 |
| 33. | Programs in the College of Architecture and Engineering take unnecessarily long to complete | 1 | 2 |
| 34. | Students in the College of Architecture and Engineering do not spend most of their time just designing and drawing | 1 | 2 |
| 35. | There is usually a high failure rate among students taking programs in the College of Architecture and Engineering | 1 | 2 |

## SECTION V

KNOWLEDGE TEST ON GENERAL CONCEPTS

STATE WHETHER THE FOLLOWING STATEMENTS ARE:
TRUE (1), FALSE (2) OR DON'T KNOW (D/K) (3) (CIRCLE)

| | | TRUE | FALSE | D/K |
|---|---|---|---|---|
| 36. | Lifts, water and electrical installations; ventilation and air condition installation form a significant part of the building industry | 1 | 2 | 3 |
| 37. | Economics, law and sociology are relevant subjects to all students in the College of Architecture and Engineering | 1 | 2 | 3 |
| 38. | Engineers and Architects are the only consultants in the building industry | 1 | 2 | 3 |
| 39. | To become a Building Contractor in Kenya, one must be an Engineer, Architect, Quantity Surveyor or Estate Manager | 1 | 2 | 3 |
| 40. | There are no legislations governing the practice of consultants in the building industry in Kenya | 1 | 2 | 3 |
| 41. | Professional work in the building industry can be done with the help of computers | 1 | 2 | 3 |
| 42. | Dams, power plants, rail-lines and bridges are not part of the building industry | 1 | 2 | 3 |
| 43. | Examples of professional bodies in the building industry in Kenya are: A.A.K; I.S.K. & I.E.K. | 1 | 2 | 3 |
| 44. | To be considered for registration as a consultant in the building industry in Kenya, one must pass the relevant professional examination | 1 | 2 | 3 |

## SECTION VI

PROFILE/ATTITUDE

IF YOU FEEL THE FOLLOWING STATEMENTS APPLY TO YOU, CIRCLE 1 (YES); IF NOT, CIRCLE 2 (NO)

| | | YES | NO |
|---|---|---|---|
| 45. | I like solving mathematical problems | 1 | 2 |
| 46. | Work that involves concentration and repetition (e.g. drawing) bores me | 1 | 2 |
| 47. | I enjoy reading long texts or big documents | 1 | 2 |
| 48. | In an examination, I would rather do questions which involve less writing and more calculations | 1 | 2 |
| 49. | I don't think I gain much from group discussions in class | 1 | 2 |
| 50. | I dread work that involves the use of calculators, computers and similar equipment | 1 | 2 |
| 51. | I do not find it difficult taking a lot of notes during lectures | 1 | 2 |
| 52. | I understand concepts more easily by doing a lot of practical examples | 1 | 2 |
| 53. | I enjoy writing long essays | 1 | 2 |
| 54. | I would rather do a class test/quiz than a class presentation | 1 | 2 |

## SECTION VII

SATISFACTION WITH MAJOR

PLEASE INDICATE HOW SATISFIED YOU ARE WITH THE FOLLOWING ASPECTS OF YOUR DEGREE PROGRAM;

CIRCLE 1 = VERY DISSATISFIED (VD) 3 = SATISFIED (S)
2 = DISSATISFIED (D) 4 = VERY SATISFIED (VS)

| | | | | | |
|---|---|---|---|---|---|
| 55. | Job opportunities after graduating | 1 | 2 | 3 | 4 |
| 56. | The period your degree program will take to complete | 1 | 2 | 3 | 4 |
| 57. | Opportunities for further studies (e.g. Masters, etc.) | 1 | 2 | 3 | 4 |
| 58. | Availability of learning facilities (e.g. Departmental library, workshops, access to computers, etc.) | 1 | 2 | 3 | 4 |
| 59. | Relevance of your degree program to Kenya's socioeconomic development | 1 | 2 | 3 | 4 |
| 60. | The type of career (profession) your degree program is preparing you for | 1 | 2 | 3 | 4 |
| 61. | Your perception of the status of your degree program in relation to other degree programs in the University | 1 | 2 | 3 | 4 |
| 62. | The relevance of the subjects you are currently taking to your degree program | 1 | 2 | 3 | 4 |

## SECTION VIII

PLEASE COMPLETE THE FOLLOWING TABLE: (WRITE N/A IF NOT APPLICABLE)

| PERSON | AGE | EDUCATION<br>e.g. 0-Level, A-Level, etc. | OCCUPATION<br>e.g. Teacher, Farmer, etc. |
|---|---|---|---|
| 63. Father/Guardian | | | |
| 64. Mother | | | |

**THANK YOU VERY MUCH**

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